

DEVELOPMENT OF ACOUSTIC LEVITATION FOR PVA COATING OF  
MICROSHELLS\*

Robert Reibold, Stephan Letts and Robert Cook

University of California  
Lawrence Livermore National Laboratory  
P.O. Box 808, Livermore, CA 94551

We have developed an apparatus that stably levitates a single microshell using an acoustic standing wave. The apparatus consists of an ultrasonic generator (homogenizer/mixer) and a reflector that is adjusted to produce a standing acoustic wave. At sufficient acoustic power, microshells stably levitate at a position slightly above the planes of minimum pressure where the acoustic force acting on the shell exactly balances gravitational force. We have investigated coating a shell with aqueous PVA solutions with this apparatus. Difficulties were encountered in metering the minute quantities of liquid (in the range of 40 nl) needed for the coating. It was found that an aerosol mist injected in the acoustic field would envelop the levitated microshell, provided it was wettable. Drying was accelerated using infrared heating. Surface finish of the dry coating was occasionally good, although thickness uniformity was distorted by the acoustic field. A method for random tumbling of the shell is needed to achieve uniform coatings .

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